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A COMPARISON STUDY ON LENGTH OF STAY AND READMISSION DATA ON
PATIENTS HOSPITALIZED FOR A RADICAL PROSTATECTOMY WITH AND
WITHOUT CLINICAL PATHWAY IMPLEMENTATION

BY

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A THESIS PRESENTED TO THE GRADUATE SCHOOL
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Without Clinical Pathway Implementation

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**Abstract of Thesis Presented to the Graduate School
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By

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Chairperson: Sandra F. Seymour
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The purpose of this research was to conduct a comparison study on length of stay and readmission data in patients hospitalized for a radical prostatectomy with and without clinical pathway implementation. A retrospective chart review of three study groups was conducted. The first group consisted of all subjects prior to implementation of clinical pathways. The second and third groups consisted of all subjects after implementation of clinical pathways with the third group utilizing clinical pathway documentation forms.

Study findings indicated that there was no significant difference between the subject groups in regards to demographic data. However, there was a significant difference in mean length of stay between the groups ($F = 19.98$, $p = 0.0001$) but no significant difference in total readmissions within 30 days. The development and implementation of clinical pathways is an effective strategy to manage health care costs while maintaining quality in a managed care environment.

CHAPTER 1

INTRODUCTION AND PURPOSE OF THE STUDY

Problem

The problem of increasing health care costs in the United States is a major challenge facing the health care system. In 1993, the United States health care spending was 14% of the Gross National Product. This is equivalent to approximately 1 of every 7 dollars being spent on health care with hospitals comprising the largest area of spending in the health care system (Calkins, Fernandopulle, & Marino, 1995). The government and health care payers are implementing strategies to control health care costs which are \$650 billion per year and rising (Clark, Steinbinder, & Anderson, 1994).

Managed care is a system of health care that focuses on high quality and cost efficient care with an emphasis on wellness and prevention aspects of health (Danzi, 1996). A managed care organization establishes specific measures that are used by the provider system or health insurance program to render health services to a certain population within a given budget (Calkins et al. , 1995).

A more cost conscious health care environment is emerging, and hospitals in the United States are changing in response to financial constraints and the anticipation of national health care reform (Calkins et al. , 1995). In the 1990s, trends in patient care management include managed care, case management, and clinical pathways. A major purpose of managed care, case management, and clinical pathways is to promote quality care while controlling health care costs. These major trends are incorporated in the

hospital industry by including clinical utilization improvements that consist of hospitals decreasing costs by reducing length of stay, improving clinical protocols, and eliminating unnecessary testing (Ignatavicius & Hausman, 1995).

With shortened hospital stays, health care providers have less time for patient and family education about home care and less time for coordination of home health and community agency services. Consequently, patients and families may be discharged from the hospital with unmet home care needs that increase the patient's risk for complications and hospital readmissions (Titler & Pettit, 1995). Caution must be taken as hospitals face increasing pressure to reduce overall use of costly inpatient services, and a cost containment policy must not be enacted at the expense of patient care (Gooding & Jette, 1985; Koch, Smith, Hodge, & Brandell, 1994).

Clinical pathways have been recognized as a significant mechanism for planning and controlling utilization of clinical resources and patient length of stay (Cohen, 1991). Clinical pathways are interdisciplinary care plans that outline the expected plan of care for patients with a particular diagnosis, procedure or symptom. In addition, clinical pathways are tools used by the health care team to identify patient outcomes (Ignatavicius & Hausman, 1995). The development and implementation of clinical pathways is an effective strategy to manage health care costs while maintaining quality in a managed care environment (Clark et al. , 1994).

Purpose Statement

The purpose of this research was to conduct a comparison study on length of stay and readmission data on patients hospitalized for a radical prostatectomy with and without clinical pathway implementation.

Hypotheses

1. There is a decrease in lengths of stay between the subjects having a radical prostatectomy after clinical pathway process implementation as compared to the subjects having a radical prostatectomy prior to clinical pathway process implementation.
2. There is no difference in readmission rates between the groups of subjects having a radical prostatectomy before and after clinical pathway process implementation.

Definition of Terms

Clinical pathway is an interdisciplinary patient care plan that details patient care management over a period of time with a focus on patient outcomes (Ley, 1995).

Length of stay is the number of hospital days a patient is admitted for a radical prostatectomy from the date and time of admission to the date and time of discharge.

Readmission is a patient admission to the hospital within a timeframe of 30 days after the initial hospital discharge.

Radical prostatectomy is a surgical operation that involves removal of the entire prostate gland and seminal vesicles (Baggish, 1995).

Assumption

The information obtained from the Clinical Resource Management office and the subject's medical record is accurate and contains no false information.

Limitations

This is a nonexperimental study design that does not enable the investigator to establish a cause and effect relationship between the variables. In addition, a nonexperimental design offers the researcher no control over study variables. This study uses a convenience sample that limits the ability to generalize the study findings. Also, a

threat to construct validity is mono-operation and mono-method bias. Furthermore, data in medical records are not always complete resulting in a limitation in data collection.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

In this chapter, King's (1981) Theory of Goal Attainment as a framework for clinical pathway implementation in a hospital setting was discussed. In addition, a literature review of topics related to this study was provided.

Theoretical Framework

Imogene King's Theory of Goal Attainment provides a theoretical framework for clinical pathways. Hampton (1993) states that King's Theory of Goal Attainment provides a framework for managed care. Managed care is a system of health that focuses on high quality and cost efficient patient care (Danzi, 1996). Clinical pathways are tools used in the hospital managed care environment that identify a timeline of patient activities and interventions that must occur daily to promote proficient use of resources and desired patient outcomes (Hampton, 1993).

King's (1981) Theory of Goal Attainment was derived from her open systems framework that identifies personal, interpersonal, and social systems. King states that each individual is a personal system and the relevant concepts in a personal system are perception, self, body image, growth and development, space, learning, and time. In addition, she states an interpersonal system is formed with interacting human beings and that the concepts of the personal system are relevant to the interpersonal system.

Furthermore, other pertinent concepts in the interpersonal system are communication, interaction, transaction, role, and stress.

King's (1981) definition of a social system is "an organized boundary system of social roles, behaviors, and practices developed to maintain values and the mechanisms to regulate the practices and rules" (p. 115). The concepts associated with the personal and interpersonal system relate to the social system. In addition, other concepts that are associated with the social system are organization, authority, power, status, decision making, and control.

Personal and social systems influence the quality of care. However, the major element in King's Theory of Goal Attainment relates to the interpersonal system. According to King (1981), two people who are usually strangers "come together in a health care organization to help and to be helped to maintain a state of health that permits functioning in roles" (p. 142). King's goal attainment theory is founded on the interaction process of the nurse and patient with the practice of nursing occurring through interpersonal relationships (Hampton, 1993).

King's (1981) definition of nursing is "a process of human interactions between nurse and client whereby each perceives the other and the situation; and through communication, they set goals, explore means, and agree on means to achieve goals" (p. 144). The basic assumption of King's goal attainment theory is also the basic assumption of the nursing process. This basic assumption addresses the process of the nurse and patient communicating information, setting mutual goals, and proceeding to achieve these set goals (George, 1995).

Clinical pathways propose several parallels to King's goal attainment theory. King's goal attainment theory and the successful application of clinical pathways involve nurse and patient interaction and discussion. The Theory of Goal Attainment depicts how the nurse and patient interact to achieve goal attainment. Similarly, clinical pathways describe the actions that need to occur in order to attain daily and long-term goals. Clinical pathways, developed by clinical experts, list necessary interventions that result in achievement of specific patient outcomes. The patient and family members have little or no input into the composition of the clinical pathway. However, to individualize the patient care plan the patient must be involved in planning his or her care. The most effective utilization of clinical pathways involves individualization of the patient care plan in order to maximize outcome achievement and patient satisfaction. Through mutual goal setting, the goal attainment theory provides a framework for this individualization while allowing achievement of the cost and quality goals of managed care (Hampton, 1993).

Mutual goal setting and decision making occur in King's Theory of Goal Attainment and utilization of clinical pathways. There is a continual process of sharing and identification of concerns and expectations from both the patient and the nurse. King states that transactions, agreements between the patient and the nurse, will lead to goal attainment (King, 1981; Hampton, 1993).

Case Management

Case management is a patient care delivery system that focuses on the accomplishment of specific outcomes within a certain time frame and with appropriate use of resources. Case management encompasses a patient's entire episode of illness and

includes all settings in which the patient receives nursing care (Lynn-McHale, Fitzpatrick, & Shaffer, 1993).

Nursing case management is a system that employs the nursing process in collaboration with other health care professionals in order to meet the patient's needs. The premise of nursing case management is that patient care must be coordinated across a continuum of care settings with multiple providers of care. In 1985, the first nursing case management model was developed at the New England Medical Center Hospitals (NEMCH) in Boston, Massachusetts. This unit-based model assigned the primary care nurse as the case manager (Ignatavicius & Hausman, 1995). The NEMCH are known as the pioneers of using nurses as case managers. The goals of this model were to achieve clinical and financial outcomes for allocated lengths of stay within diagnostic related groups (Giuliano & Poirier, 1991).

Case management is endorsed by the American Nurses Association and within the nursing community is becoming an affirmed framework of practice. There are different case management models, but the core elements generally include an individual who coordinates and monitors care given to multiple patients by multiple services (Rheaume, Frisch, Smith, & Kennedy, 1994). The foundation of nursing case management is the development of a relationship between the nurse case manager, the patient and family, and other healthcare professionals. Nurse case managers play a vital role in coordinating the care for complex patients as well as promoting effective communication among patients, families, and members of the healthcare team (Sohl-Kreiger, Laggard, & Scherrer, 1996).

Case management is an effective health care delivery system that focuses on high-risk and high-cost patients to eliminate fragmentation of care, to prevent duplication of services, and to maximize containment of costs. A variety of health care professionals including social workers, physicians, staff nurses and advanced practice nurses are employed within the case management model (Sterling, Noto, & Bowen, 1994). In the review of literature, several authors promoted the clinical nurse specialist as the ideal person for the role of case manager.

Meisler and Midyette (1994) state that the best qualified individual to meet the demands of today's health care system is the masters prepared case manager. The clinical nurse specialist (CNS) is in a unique situation among health care providers to execute the case management role to accomplish the goals of improving quality of care and reducing costs (Norris & Hill, 1991). Gibson, Martin, Johnson, Blue and Miller (1994) assert that the success of the Sioux Valley Hospital case management program is attributed to the CNS case manager who is able to provide coordinated and individualized patient care in a cost-efficient manner. Conway-Svec (1991) identify case management as an area of future job opportunities for clinical nurse specialists and recommend that the masters prepared CNS is most appropriate for the case manager role.

Clinical nurse specialists are continually being faced with change in practice institutions as well as at the national level. At Vanderbilt University Medical Center, the clinical nurse specialist role has successfully evolved into case manager roles that include both clinical and financial role components (Payne & Baumgartner, 1996). Furthermore,

Strong (1992) identified the clinical nurse specialist as one who possessed advanced skills that enhanced the development and implementation of case management systems.

Cronin and Maklebust (1989) listed both positive and negative aspects of utilization of a baccalaureate prepared nurse as a case manager. Improvements of overall quality of patient care and increased job satisfaction were reported. However, nurses verbalized their frustrations and problems with effectively managing cases while they were directly involved in patient care delivery. Also, the baccalaureate nurses stated the need for advanced education or experience to implement system level changes and to be more effective in delegation and collaboration processes.

In certain settings, staff nurses are performing case management duties. Alvarez (1996) states this situation can cause two problems if an advanced practice nurse is designated as the case manager. One problem is that an element of the staff nurse's job is taken away and the opportunity to provide the staff nurse with a stimulating clinical role as the case manager has also disappeared. In addition, administrators are likely to question the cost of advanced practice nurses conducting case management activities. Alvarez believes that in certain areas the advanced practice nurse can be appropriate as a case manager. However, it would be useful to clarify situations in which the case manager role is best filled by an advanced practice nurse. Lastly, Gibbs, Lonowski, Meyer, and Newlin (1995) explore the role of the clinical nurse specialist in case management as an acting consultant to physicians, nurse managers, staff nurses, and other health care professionals regarding complex patient health care needs.

Hospital case management models have shown that the benefits of case management

are decrease in length of stay and substantial cost savings. In addition, patient and staff satisfaction have improved. Third party payers, particularly health insurance companies, encourage the use of case management by providing discounts and incentives for hospitals to employ this system. Furthermore, the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) supports the case management delivery of care system. In fact, the 1995 JCAHO guidelines require an interdisciplinary, collaborative patient care approach, and case management allows for collaboration of health care professionals. Other advantages of a case management system are improved quality of care, enhanced communication among health care members, and decreased staff absenteeism and turnover (Ignatavicius & Hausman, 1995).

Clinical Pathways

Clinical pathways are tools to guide the management of patient care (Martich, 1992). Case management utilizes clinical pathways to describe fundamental components of patient care along a continuum of time (DeWoody & Price, 1994). In addition, clinical pathways are interdisciplinary patient care plans that detail patient care management over a period of time with a focus on patient outcomes (Ley, 1995).

A clinical pathway is a collaborative patient care plan identifying vital aspects of the care plan answering the who, what, when, where, and why. The clinical pathway involves the interdisciplinary health care team, the patient, and family members and can be utilized in various settings including inpatient hospitalizations, outpatient clinics, rehabilitation or the home care setting. Clinical pathways can be based on a daily or episodic approach or may include the entire aspect of the interdisciplinary care plan. In

addition, the clinical pathway can be implemented prior to the hospital admission, during hospitalization, after a hospital discharge, or during an outpatient procedure. Furthermore, the why component of the clinical pathway process is answered by the rationale to provide optimal care at the optimal time (Coordinated Care Task Force, 1995).

Similar to case management, there are different ideas on the process of development and implementation of clinical pathways. Generally, clinical pathways have four dominant features which are patient outcomes, timelines, collaboration, and comprehensive aspects of care. Clinical pathways normally list expected patient outcomes by the time of discharge from the hospital setting. Also, clinical pathways have explicit timelines for sequencing interventions. In addition, clinical pathways promote collaboration between various health care providers and are a reflection of interdisciplinary interventions. Lastly, clinical pathways track comprehensive aspects of patient care such as treatments, diagnostic tests, medications, diet, activity level, consults, patient teaching, and discharge planning (Ignatavicius & Hausman, 1995).

Not all patients are identified as candidates for clinical pathway implementation (Greensfield, 1995; Ignatavicius & Hausman, 1995). Clinical pathways are best suited for patients expected to follow the timeline without experiencing complications. Use of clinical pathways may not be appropriate for patients with complex medical problems or for patients experiencing complications (Ignatavicius & Hausman, 1995).

Clark et al. (1994) state the clinical pathway and the anticipated discharge date is information shared with the patient, and this process facilitates communication of

expectations and discharge planning. Clinical pathways serve as guidelines for patient care management and have beneficial outcomes for the hospitals, third-party payers, physicians and other health care providers, as well as the patient. Clark and colleagues (1994) discussed the success of a total hip replacement clinical pathway. In this study, the orthopedic physicians were supportive in utilizing the clinical pathway process of patient management. Before implementation of the clinical pathway, the mean length of stay for patients undergoing a total hip replacement was 9.4 days. During the implementation phase of the total hip replacement clinical pathway, the mean length of stay was 6.3 days. Also, during the implementation phase of this clinical pathway, patients undergoing a total hip replacement who were not managed using the pathway were also examined and found to have a mean length of stay of 8.4 days. Between the two groups there was a decrease in charges that amounted to \$2,200 that translated into cost savings of \$330,000 per year if 150 total hip replacements were performed.

The article by Korpiel (1995) identified a successful clinical pathway for coronary artery bypass graft (CABG) surgery that was developed by six hospitals in the Chicago area. Selection of this surgical procedure was based on high-cost and high-volume data. In 1993, 4 out of the 6 hospitals implemented the CABG clinical pathway. During the first year of implementation, there was a decrease of 1.7 days in the average length of stay and greater than \$896,000 cost savings in hospital charges. Not only did the clinical pathway provide cost savings and increased quality, but the pathway also enabled the hospitals to gather baseline community data to use for future comparisons of results. In addition, the creation of a community standard could be shown to third-party payers,

and community residents had available information about the high quality of CABG care at local hospitals. Furthermore, development and implementation of the CABG clinical pathway allowed for collaboration between local hospitals that promoted sharing information and ways to improve the quality of care in the community.

Kowal and Delaney (1996) conducted a study at St. Johns Hospital and Medical Center in Detroit, Michigan, demonstrating the utilization of a nurse-developed patient focused clinical pathway and its outcome on two cost indicators, length of stay and resource utilization. Pre and post pathway fiscal data were tracked and examined for 64 mastectomy cases. Findings from this study revealed a decrease in length of stay with appreciable reduction in cost per case in the group employing clinical pathways. Other noteworthy benefits of clinical pathways include enhanced quality and greater continuity of patient care. In addition, clinical pathways are one method of case management that accentuates multidisciplinary collaboration of health care professionals.

Many authors discussed the positive role of clinical pathways in relation to patient teaching and documentation of patient education (Doherty & Coleman, 1995; Greenfield, 1995; Kealey & Burger, 1995; Ley, 1995; Marvin, 1995; Mosher, Cronk, Kidd, McCormick, Stockton, & Sulla, 1992; Sciartelli, 1995). Kealey and Burger (1995) claim that clinical pathways are an excellent teaching tool for all multidisciplinary team members. In addition, documentation of outcomes in the patient's record increases awareness of the individual contributions of patient care provided by the various multidisciplinary health care providers.

According to Nugent and Schults (1994), clinical pathways can lead to improved patient satisfaction and a more valuable understanding and matching of patient

expectations with outcomes. Furthermore, Redick, Stroud and Kurack (1994) state clinical pathways can streamline charting, can be used to predict and prevent patient complications, can anticipate staffing needs, and can generate quality assurance and continuous quality improvement questions.

Length of Stay

The primary determinant of consumption of hospital resources is the patient's length of stay (Lutjens, 1993). A patient's length of stay in a hospital is one of the most visible elements of hospital care costs (Leiby & Shupe, 1992). The average length of stay of hospitalized patients has declined since the introduction of the prospective payment system (Shamian, Hagen, Hu, & Fogarty, 1994). The implementation of the Tax Equity and Fiscal Responsibility Act of 1983 empowered the federal government to determine a length of stay for hospitalized patients in the United States based on their medical diagnosis at the time of hospital discharge. Patients were assigned to one or more groups of 470 mutually exclusive diagnosis-related group (DRGs) categories. The DRG system is a cost-per-case basis with a goal to decrease the national healthcare costs by supplying a payment incentive to decrease the length of stay of hospital admissions (Lutjens, 1993).

Farren (1991) conducted an experimental research test to determine the effect of discharge planning on length of hospital stay. This study revealed that if discharge planning was implemented within 24 hours of the patient's hospital admission there was a significant reduction in length of stay. This relates to clinical pathway implementation and its role in expediting patient discharges. By reviewing the clinical pathway with patients and family members, the nurse provides a way to allow the patient and

family members to participate in patient care management, to understand expected interventions and outcomes, and to identify any potential discharge needs (Bolinger & Janicin, 1995). In addition, another study revealed a strong link between discharge planning and length of stay (Marchette & Holloman, 1986).

In order for hospitals to maximize cost effectiveness, strategies to achieve high quality care at the lowest possible expense are being implemented (Shamian et al. , 1994).

A clinical pathway is an example of a strategy used to decrease the patient's length of stay and at the same time, to maintain effective use of resources (Redick et al. , 1994).

Hospitals have implemented clinical pathways and have demonstrated that to use clinical pathways has decreased the length of stay with efficient use of resources (Dewoody & Price, 1994; Kealey & Burger, 1995; Redick et al. , 1994).

Litwin, Kahn, and Reccius (1993) demonstrated that length of stay was the primary determinant of hospital cost. They noted that the cost per day was the same for healthy patients undergoing a radical prostatectomy and patients with comorbid diseases. Licht and Klein (1994) assessed the impact of a decrease length of hospital stay for patients undergoing a radical retropubic prostatectomy for localized prostate cancer and its effect on complication rates and hospital costs. These researchers implored a variety of ways to reduce the hospital length of stay which included outpatient preoperative bowel preparation, direct admission on the day of surgery to the operating room, early and more extended postoperative ambulation, the initiation of earlier postoperative oral intake, earlier use of oral pain medication, and routine removal of pelvic drains at 72 to 96 hours postoperatively regardless of volume of drainage. Licht and Klein (1994) demonstrated

reduced hospital stay after radical retropubic prostatectomy with notable cost savings without an increase in morbidity.

Readmissions

Inpatient hospital care accounts for the largest component of expenditures in the United States health care system. With implementation of prospective payment systems, there is an incentive to decrease hospital length of stay which leads to the concern of the possibility of patients being readmitted to the hospital for a problem related to the initial hospitalization (Weinberger & Oddone, 1989). Patient readmission after the first hospitalization is more costly in terms of human and financial means, and studies have demonstrated that the admission of an elderly patient is commonly a readmission for the same or related past hospitalization (Kellogg, Brickner, Conley, & Conroy, 1991; Leiby & Shupe, 1992). Kellogg and colleagues (1991) found that the most powerful indicator of a six month hospital readmission rate in elderly patients is previous history of hospitalization.

Strategies to reduce hospital readmissions have concentrated on geriatric consultation wards. One study revealed that the most cost-effective way of decreasing readmissions was to provide inpatient assessment of discharge planning needs and follow-up with outpatient care (Weinberger & Oddone, 1989). Another study, by Leiby and Shupe, 1992), indicated that home health care can decrease hospital readmissions for the elderly patient.

Goldstein (1991) examined the effectiveness of a Learning Center in preparing patients with a right atrial catheter for discharge. One of the hypotheses stated that the

readmission rate for complications related to the right atrial catheter would be lower depending on the attendance to the Learning Center. The results of this study strongly indicate that establishment of an education center that provides patients with hands-on learning opportunities is an effective way to enable patients and their family members the ability to learn and be able to safely provide necessary home care.

As the length of stay for patients has decreased, so has the timeframe for implementation of patient discharge planning. Discharge planning is an important aspect of patient care. Readiness for discharge planning is one part of the discharge planning process that gives an idea of the patient and family members' ability to leave the hospital. Discharge readiness involves assessment of physiologic stability of the patient, cognitive and psychomotor competence of the patient and family members to maintain patient care management at home, perceived self-efficacy to provide self-care management interventions, social support availability, and access to the health care system and community resources. As length of stay continues to decrease, it is vital that discharge readiness assessment be a significant part of patient care management so patients are discharged with no unmet home care needs, therefore, decreasing patient complications and readmissions (Titler & Pettit, 1995).

Radical Prostatectomy

Cancer of the prostate is a significant public health problem. Striking 1 in 11 American men, 165,000 new cases of prostate cancer are diagnosed yearly (Maxwell, 1993). In the United States, it is the most common cause of cancer in males, with men over the age of 55 years being the most susceptible. In addition, prostate cancer is the second cause of cancer deaths in men (Held, Osborne, Volpe, & Waldman, 1994; Ronk

& Kavitz, 1994). With men living longer life spans, an increase in the problem of prostate cancer will occur in the United States (Maxwell, 1993).

Screening for early prostate cancer is an issue highly debated. Preventive measures should be taken due to the increasing incidence and mortality of persons with prostate cancer (Denis, 1995). Prostate cancer detection is increasing due to the heightened prevalence of screening tests. The American Cancer Society recommends an annual serum prostate-specific-antigen test and a digital rectal examination on every man 50 years and older (Fowler, Barry, Lu-Yao, Roman, Wasson & Wennberg, 1993; Greco & Blank, 1993; & Schroder, 1995). In addition, the treatment options for prostate cancer are highly controversial. Physicians vary in their use of surgical techniques, radiotherapy and hormonal manipulation in treatment of prostate cancer (Held et al. , 1994; & Maxwell, 1993). Furthermore, prostate cancer treatment depends on a variety of factors including the stage of the disease, the patient's age, and the patient's overall condition (Held et al. , 1994; & Salmans, 1993).

Prostate cancer is a disease that progresses through four distinct stages. Prostate cancer in Stage A is when the malignant tumor is entirely confined within the capsule enclosing the prostate. The tumor in this stage may have existed for years without the patient experiencing any symptoms. In Stage A, the tumor is so small that it is undetectable by a health care provider during the digital rectal examination. In Stage B, the prostate cancer is a malignant tumor which is still confined within the capsule enclosing the prostate. However, the tumor is large enough to be detected during the digital rectal examination. In addition, in Stage B, patients may not notice any symptoms of disease. In Stage C, the prostate cancer is a malignant tumor that escapes the confines

of the capsule enclosing the prostate and invades surrounding body areas, particularly the seminal vesicles. Lastly, in Stage D the prostate cancer has metastasized to other body parts. The common attack points in Stage D are lungs, lymph nodes, bones, and liver (Morganstern & Abrahams, 1994).

In general, surgery is employed for localized tumors. Radical prostatectomy is a surgical operation for prostate cancer that involves removal of the entire prostate gland and the seminal vesicles. There are two approaches to a radical prostatectomy. The retropubic prostatectomy approaches the prostate gland from under and behind the pubic bone and the perineal prostatectomy approaches the prostate gland through the perineum, the area between the scrotum and the anus (Salmans, 1993). The most used surgical approach is the retropubic prostatectomy. Most surgeons favor this approach because at the time of surgery it allows for bilateral pelvic lymph node removal (Maxwell, 1993).

Koch, Smith, Hodge, & Brandell (1994) discussed a program created at the Department of Urology at Vanderbilt University Medical Center designed to control costs for patients having a radical prostatectomy while maintaining a high level of care. Initially, the program identified unnecessary items and various factors that contributed to patient costs after a radical prostatectomy. A clinical pathway for a radical prostatectomy was developed under the coordination of a clinical nurse specialist. After full implementation of this program, a decreased length of total hospital stay resulted from a mean of 5.7 days to 3.6 days. In addition, the average adjusted total hospital charges were decreased from \$13,783 to \$7741 with no discernible counter effect on morbidity rates.

Summary

In this chapter, Imogene King's Theory of Goal Attainment was provided as a framework for managed care and clinical pathways. A review of literature on case management, clinical pathways, length of stay, readmissions, and radical prostatectomy was presented.

Case management as a patient care delivery system that focuses on high-risk and high-cost patients was discussed. Also, the role of the clinical nurse specialist in case management was discussed. The benefits of case management were reviewed and hospital case management models were shown to decrease the length of patient stay with substantial cost savings.

Radical prostatectomy is a major health problem that is a high-volume and high-cost hospital procedure. Execution of a radical prostatectomy clinical pathway demonstrated that clinical pathway implementation decreased length of stay and reduced hospital costs. In addition, it has been shown that clinical pathways are tools of managed care that improve the delivery of patient care and control costs.

With decreased hospital length of stay, health care providers must ensure that there are no unmet home care needs when discharging patients in order to avoid patient complications after discharge and patient readmissions. In conclusion, the literature review presented the development and implementation of clinical pathways as an effective way to manage health care costs while maintaining a high quality of care in a managed care environment.

CHAPTER 3

METHODOLOGY

Introduction

This chapter consists of an explanation of the research design, sample and setting description and discussion of the instrumentation and procedure plan. In addition, the statistical methods used in data analysis are presented.

Research Design

The purpose of this research was to conduct a comparison study on length of stay (LOS) and readmission data in patients being hospitalized for a radical prostatectomy with and without clinical pathway implementation. This retrospective study was modeled after another study (Coyner, R. , 1995) whose stated purpose was to determine the effect of implementation of a clinical pathway on length of stay and readmission rate in hospitalized patients having a total knee arthroplasty. Coyner (1995) demonstrated that there was a decrease in length of stay between the patients having a total knee arthroplasty who were on a clinical pathway as compared to the patients having a total knee arthroplasty who were not on a clinical pathway. In addition, there was no difference in the readmission rates between the groups of patients having a total knee arthroplasty who were on a clinical pathway as compared to the patients having a total knee arthroplasty who were not maintained on a clinical pathway.

In order to obtain representative data, three study groups were addressed since the process of clinical pathway implementation was started by the urologists prior to the development and utilization of clinical pathway documentation forms. Subject demographics, LOS, and readmission variables were collected and compared in the three groups of subjects. One group consisted of all subjects having a radical prostatectomy during a period of one year, 1 February 1994 - 31 January 1995, prior to process implementation of a radical prostatectomy clinical pathway. The second group consisted of all subjects having a radical prostatectomy during the period of 15 months, 1 February 1995 - 30 April 1996, after process implementation of the radical prostatectomy clinical pathway prior to the development and utilization of clinical pathway documentation forms. Lastly, the third group consisted of all subjects having a radical prostatectomy during the period of eight months, 1 May 1996 - 31 December 1996, after implementation of the radical prostatectomy clinical pathway utilizing clinical pathway documentation forms.

This is a nonexperimental design and one limitation includes the inability to establish cause and effect relationships between the variables. Other limitations are that the researcher has no control of variables in a nonexperimental design and there are limitations of generalization of the findings.

Sample and Setting

This study was conducted in a 576 bed tertiary, referral university affiliated hospital in North Central Florida. Inclusion criteria included all patients having elective radical prostatectomy surgery. Exclusion criteria excluded all patients with preoperative medical

problems that required hospitalization before the day of surgery and all patients scheduled for additional surgeries other than the radical prostatectomy. The sample size was determined by power analysis in consultation with a statistician. In order to reject a hypothesis of no change in length of stay with a statistical power of at least 0.95 while any two group means length of stay differed by as much as one day, it was concluded that 22 subjects per group were required to give the desired sensitivity with the level of significance at 0.05.

Instrumentation

A data collection form was used to collect subject demographics, clinical information, length of stay, and readmission data from each medical record. This computerized subject information was obtained from the Clinical Resource Management (CRS) office of the study facility. Content validity of the data collection form was determined by review with the supervisory committee members and two master's prepared nurses employed at the study facility who are familiar with the clinical pathway process. Interrater reliability of the data obtained from the CRM office was determined by the process of the primary investigator reviewing five subject records from each subject group and comparing the data collected with that of the CRS office.

Procedure

For the data collection periods, a list of subject records and data for patients having a radical prostatectomy were obtained from the CRS office. Subject records were obtained and reviewed in the hospital's medical records department. Subject records which met the criteria for selection were assigned a code number. The code number was entered

with the medical record number of the subject in a log book kept by the primary investigator, and the data collection form only contained the code number of the subject.

Human Subjects

This study was submitted to the University of Florida Institutional Review Board and approved for exempt status. Approval from the study facility was obtained for accessing medical records to obtain subject data collection. Confidentiality was maintained by assigning code numbers to the subject records and this number was recorded in a log book along with the medical record number of the subject.

The data collection form only contained the code numbers and there were no identifiers that would allow the patient to be known. Therefore, privacy was protected. The primary investigator was the only person reviewing subject records and recording data in the medical records department. In addition, the log book and data collection forms were only accessible to the primary investigator and supervisory committee members. Lastly, all research data were kept in a locked file cabinet.

Data Analysis Plan

The SAS computer system was used to generate descriptive statistics to describe the subject demographic characteristics of the sample. The analysis of variance (ANOVA) and the Student-Newman-Keuls multiple comparison procedure were used to test the length of stay hypothesis. A two sample proportion test was used to test the readmission hypothesis in all subject groups.

CHAPTER 4

ANALYSIS AND PRESENTATION OF DATA

Introduction

The purpose of this chapter is to describe and present the data and analysis from this study. Sample characteristics and study results based on the study's two hypotheses are provided.

Description of the Sample

A retrospective chart review of 144 medical records was conducted utilizing information obtained from the study facility's Clinical Resource Management Office. Two charts were eliminated from the study since they met exclusion criteria. Therefore, the study sample consisted of 142 subjects. The first study group consisted of 52 subjects having a radical prostatectomy during 1 February 1994 - 31 January 1995, the time period prior to process implementation of a radical prostatectomy clinical pathway. The second group consisted of 51 subjects having a radical prostatectomy during 1 February 1995 - 30 April 1996, the time period after process implementation of a radical prostatectomy clinical pathway and prior to the development and utilization of clinical pathway documentation forms. Lastly, the third group consisted of 39 subjects having a radical prostatectomy during 1 May 1996 - 31 December 1996, the time period after implementation of the radical prostatectomy clinical pathway utilizing clinical pathway documentation forms.

Sample Characteristics

All subjects in this study were of the male gender. The age of the subjects ranged from 45 to 79 years with a mean of 61.92 years. Methods of payment for all subjects were 57% commercial insurance, 39.4% Medicare, 0.7% Medicaid, 1.4% in the other insurance category and 1.4% with no insurance. Discharge disposition of all subjects were 99% to home and 1% to home with home health care.

Length of stay (LOS) for the entire sample ranged from 2.0 to 11.0 days with a mean of 4.46 days. Readmissions within 30 days for the total sample were 97.2% not readmitted and 2.8% readmitted. In the total readmissions, 25% were admitted within zero to seven days, 50% were admitted within eight to fourteen days and 25% were admitted within 15 to 30 days. 100% of the total readmissions were readmitted with a diagnosis related to the initial hospitalization.

Data comparison of age and LOS in Groups I, II and III are shown in Table 4-1. Data comparison of method of payment and discharge disposition are shown in Table 4-2.

Table 4-1

Summary Measures of Age and Length of Stay for Groups I, II and III (N = 142)

Variable	n	Min	Max	Mean	SD
Group I (No Clinical Pathway Implementation)					
Age	52	45.0	79.0	60.67	7.70
LOS	52	3.0	11.0	5.48	1.53

Table 4-1--continued

Variable	n	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>SD</u>
Group II (Clinical Pathway Process Implementation Prior to Development and Implementation of Clinical Pathway Documentation Forms)					
Age	51	45.0	75.0	62.63	7.10
LOS	51	2.0	9.0	3.88	1.61
Group III (Clinical Pathway Process Implementation Utilizing Clinical Pathway Documentation Forms)					
Age	39	49.0	75.0	62.64	6.31
LOS	39	2.0	7.0	3.88	1.10

Hypothesis One

The first hypothesis was there is a decrease in lengths of stay (LOS) between the subjects having a radical prostatectomy after clinical pathway process implementation as compared to the subjects having a radical prostatectomy prior to clinical pathway process implementation. Utilizing the SAS analysis of variance procedure, a significant difference in mean LOS among the groups was found ($F = 19.98$, $p = 0.0001$). In addition, the Student-Newman-Keuls (SNK) multiple comparisons test for length of stay demonstrated there was a significant decrease in length of stay between Group I (mean = 5.481 days) and Group II (mean = 3.882 days) and between Group I (mean = 5.481 days) and Group III (mean = 3.872 days).

Table 4-2

Sample Distribution in Regards to Method of Payment and Discharge Disposition
(N = 142)

	Group I (No Clinical Pathway)		Group II (Clinical Pathway Process Implementation Without Clinical Pathway Forms)		Group III (Clinical Pathway Implementation With Clinical Pathway Forms)	
Variable	n	%	n	%	n	%
Method of Payment						
Medicare	17	32.7	21	41.2	18	46.2
Medicaid	0	0.0	1	2.0	0	0.0
Commercial Insurance	34	65.4	28	54.9	19	48.7
Other	1	1.9	0	0.0	1	2.6
No Insurance	0	0.0	1	2.0	1	2.6
Discharge Disposition						
Home	52	100	50	99	39	100
Home with Home Health Care	0	0	1	1	0	0

Hypothesis Two

The second hypothesis was there is no difference in readmission rates between the groups of subjects having a radical prostatectomy before and after clinical pathway process implementation. In Table 4-3, readmission data distribution is listed. All readmissions were related to the initial hospitalization. Utilizing a two sample proportion test, the study's findings indicated there was no significant difference noted in total readmissions between the three groups. The data consisted of Group I and Group II ($Z = 0.057$, $p = 0.5694$), Group I and Group III ($Z = 0.34$, $p = 0.7346$) and Group II and Group III ($Z = 0.19$, $p = 0.8474$). In addition, there was no significant difference noted in readmissions related to initial hospitalizations between the three groups.

Table 4-3

Total Sample Readmission Distribution Within 30 Days and Total Readmission Time Frames (N = 142)

Variable	Group I (No Clinical Pathway)		Group II (Clinical Pathway Process Implementation Without Clinical Pathway Forms)		Group III (Clinical Pathway Process Implementation With Pathway Forms)	
	n	%	n	%	n	%
Total Readmission						
None Readmission	50	96.2	50	98.0	38	97.4
	2	3.8	1	2.0	1	2.6
Total Readmission Time Frames						
0 - 7 Days	0	0	1	100.0	0	0
8 - 14 Days	1	50.0	0	0	1	100.0
15 - 30 Days	1	50.0	0	0	0	0

Summary

In this study, 142 subjects were examined and group comparisons were made between three groups of subjects. The first group consisted of 52 subjects having a radical prostatectomy during 1 February 1994 - 31 January 1995, the time period prior to process implementation of a radical prostatectomy clinical pathway. The second group consisted of 51 subjects having a radical prostatectomy during 1 February 1995 - 30 April 1996, the time period after process implementation of a radical prostatectomy clinical pathway prior to the development and utilization of clinical pathway documentation forms.

Lastly, the third group consisted of 39 subjects having a radical prostatectomy during 1 May 1996 - 31 December 1996, the time period after implementation of the radical prostatectomy clinical pathway utilizing clinical pathway documentation forms.

Study findings indicated that there were no significant difference between the subject groups in regards to mean age ($F = 1.25, p = 0.2908$). However, there was a significant difference in mean length of stay among the groups ($F = 19.98, p = 0.0001$) but no significant difference in total readmissions within 30 days. Furthermore, all readmissions were related to the initial hospitalization.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter includes discussion of the sample characteristics and findings related to the study's hypotheses. Recommendations for future research are also presented.

Sample Characteristics

Due to the nature of the procedure studied, all subjects were of the male gender. There was no significant difference between the subject groups in regards to mean age ($F = 1.25$, $p = 0.2908$). In all study groups, the primary sources of methods of payment were commercial insurance (57%) and Medicare (39.4%). One out of 142 subjects was discharged to home with home health care and the remaining 141 study subjects were discharged home. In conclusion, the sample characteristics of all three groups were similar.

Hypothesis One

The first hypothesis was there is a decrease in length of stay (LOS) between the subjects having a radical prostatectomy after clinical pathway process implementation as compared to the subjects having a radical prostatectomy prior to clinical pathway process implementation. Utilizing the SAS analysis of variance procedure, a significant difference in mean LOS among the groups was found ($F = 19.98$, $p = 0.0001$). The study's findings demonstrated there was a significant decrease in length of stay between

the subjects having a radical prostatectomy after clinical pathway process implementation as compared to the subjects having a radical prostatectomy prior to clinical pathway process implementation. Lutjens (1993) states that the primary determinant of consumption of hospital resources is the patient's length of stay. These data are consistent with other research findings that demonstrated utilization of clinical pathways has decreased the length of stay with efficient use of hospital resources (Dewoody & Price, 1994; Kealey & Burger, 1995; Redick et al., 1994).

The study of Licht and Klein (1994) demonstrated reduced hospital stay after radical retropubic prostatectomy with notable cost savings without an increase in morbidity. Similar to the changes that took place at the study facility, Licht and Klein's study implored a variety of ways to reduce the hospital length of stay which included outpatient bowel preparation, direct admission on the day of surgery to the operating room, early and more extended postoperative ambulation, the initiation of earlier postoperative oral intake, earlier use of oral pain medication, and routine removal of pelvic drains at 72 to 96 hours postoperatively regardless of volume drainage.

Hypothesis Two

The second hypothesis was there is no difference in readmission rates between the groups of subjects having a radical prostatectomy before and after clinical pathway process implementation. Hospital readmissions are important to examine because they occur frequently and have significant cost and quality implications (Epstein, Bogen, Dreyer & Thorpe, 1991). With implementation of prospective payment systems, there is an incentive to decrease hospital length of stay which can lead to the possibility of

patients being readmitted to the hospital for a problem related to the initial hospitalization (Weinberger & Oddone, 1989).

Research studies have indicated that the admission of an elderly patient is commonly a readmission for the same or related past hospitalization (Kellogg et al. , 1991; Leiby & Shupe, 1992). In addition, Epstein et al. (1991) stated that almost a quarter of hospitalized patients on Medicare are readmitted within a 60 day time period. Medicare as a method of payment for all subjects was 39.4% with 32.7% in Group I, 41.2% in Group II and 46.2% medicare payment in Group III. Utilizing a two sample proportion test, the study's findings indicated there was no significant difference noted in total readmissions between the three subject groups. All four readmissions were related to the initial hospitalization and there were no significant difference noted in readmissions related to initial hospitalizations between the three groups. The study's readmission data were limited to readmissions to the study hospital and there was no association noted between a decrease in length of stay and an increase in hospital readmissions.

Conclusions

Radical prostatectomy is a major health problem that is a high-volume and high-cost hospital procedure. The study's findings were consistent with other radical prostatectomy research data (Licht & Klein, 1994; Koch et. al. , 1994) and demonstrated a decrease in hospital length of stay associated with clinical pathway process implementation with no increase in hospital readmissions. The development and implementation of clinical pathways is an effective strategy to manage health care costs while maintaining quality in a managed care environment (Clark et al., 1994).

Practice Implications

Clinical pathways are recognized as a significant mechanism in promoting quality care while controlling health care costs and are vital tools in a managed care environment. Clinical pathways are one method of case management that accentuate multidisciplinary collaboration of health care professionals. The clinical nurse specialist (CNS) plays an important role in today's health care system and is instrumental in the promotion of continuity and coordination of patient care. In addition, the CNS is in an unique situation among health care providers to perform the case management role and oversee the development and implementation of clinical pathways.

Recommendations for Future Research

The following studies are recommended for future research:

1. Examination of cost analysis associated with length of stay and readmission data for radical prostatectomy patients before and after clinical pathway implementation.
2. Examination of length of stay and readmission data for patient populations representing other surgical and medical diagnoses before and after clinical pathway implementation.
3. Examination of patient and staff satisfaction associated with implementation of clinical pathways.
4. Examination of clinical pathways as patient and staff educational tools.

APPENDIX A

DATA COLLECTION FORM

Code Number _____

A COMPARISON STUDY ON LENGTH OF STAY AND READMISSION DATA IN
PATIENTS HOSPITALIZED FOR A RADICAL PROSTATECTOMY WITH AND
WITHOUT CLINICAL PATHWAY IMPLEMENTATION

DATA COLLECTION FORM

DEMOGRAPHIC DATA:

Date of birth: _____ Age: _____

Method of Payment:

Commercial Insurance _____

Medicare _____

Medicaid _____

Other (state) _____

No Insurance _____

CLINICAL INFORMATION:

Diagnoses:

Principal diagnosis: _____

Secondary diagnosis: _____

Length of Stay:

Admission date _____

Time of admission _____

Discharge date _____

Time of discharge _____

Length of stay (calculated) _____

Date of Surgery: _____

Discharge Status:

Home _____

Skilled Nursing Facility _____

Home with Home Health Care _____

Other (state) _____

Readmission Data:

Patient readmitted to hospital within 30 days of discharge:

Yes _____ No _____

If Yes: Readmission date _____

Readmission Primary Diagnosis: _____

Readmission Secondary Diagnosis: _____

Readmission occurs within: 0-7 days of discharge _____

8-14 days of discharge _____

15-30 days of discharge _____

APPENDIX B

RADICAL PROSTATECTOMY CLINICAL PATHWAY

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The Clinical Pathway is a general guideline. Patient care continues to require individualization based on patient needs and requirements.

ADDRESSOGRAPH

Patient Name: _____ MR#: _____

CLINICAL PATHWAY

TITLE: Radical Prostatectomy
SERVICE: Urology

Allergy Alert: •Note all allergies and check to ensure patient receives no medication allergic to. Call service to obtain alternative medications

CARE ELEMENT	Post-Op Day #0	Post-Op Day #1	Post-Op Day #2	Post-Op Day #3	
CARE UNIT	•Pre-op holding: OR 4.5 hrs PACU 2-3 hrs •Unit 75	•Unit 75	•Unit 75	•Unit 75	
CONSULTS					
LABS		□CBC(#____) □(K only if on diuretic)		□CBC(#____) □(K only if on diuretic)	
ASSESSMENTS	<ul style="list-style-type: none"> Notify MD: •T > 38.5 •BP <90/50 or >170/100 •HR <50 or >100 •R<12 •UOP <30 cc/hr •JP>150cc/day 	<ul style="list-style-type: none"> •VS q 2 through 10 AM POD #1 •I & O q 4 hours •Assess degree of blood in urine & JP q 2 hours •System Assessment minimum of q 12 per nursing standards 	<ul style="list-style-type: none"> •VS q 4 x 24 hours •I & O q 4 hours 	<ul style="list-style-type: none"> •VS q 8 hours •I & O q shift 	<ul style="list-style-type: none"> •VS q 8 hours •I & O q shift
TREATMENTS	<ul style="list-style-type: none"> Notify MD: •O2 Sat<90% •Frank blood in urine of JP 	<ul style="list-style-type: none"> •Pulmonary Toilet TCDB + IS (q1 * W/A) •Pulse oximetry until 10 AM POD #1 (low Sat alarm at 90%) •Foley (do not manipulate) •JP •Pneumatic compression device 	<ul style="list-style-type: none"> •Pulmonary Toilet TCDB + IS (q1 * W/A) •D/C pulse oximetry @ 10am •Foley with leg bag •JP to bulb •Pneumatic compression device •Dry sterile dressing - change qd(may leave OTA if no drainage) 	<ul style="list-style-type: none"> Pulmonary Toilet TCDB + IS (q1 * W/A) •Foley with leg bag JP - change dressing qd •D/C Pneumatic compression device, if ambulating well •Dry sterile dressing - change qd(may leave OTA if no drainage) 	<ul style="list-style-type: none"> •Pulmonary Toilet TCDB + IS (q 2 * W/A) •Foley with leg bag •JP D/C'd if output <60 cc/24 hrs (M.D.) •Dry sterile dressing - change QD(may leave OTA if no drainage)
ACTIVITY	Up in chair evening post-op x 15 min	Ambulate in hall t.i.d	Ambulate in hall qid	Ambulate in hall qid	
MEDICATIONS	<ul style="list-style-type: none"> •IV (D5 1/2 NS 20 mEq KCL @ 125cc/hr) •Ancef IV in pre-op holding •Anesthesia Drugs •Pepcid 20mg PO Pre-op 	<ul style="list-style-type: none"> •IV (D5 1/2 NS 20 mEq KCL @ 100cc/hr) •Dulcolax supp •Senna (1 tab PO qd) 	<ul style="list-style-type: none"> •Medlock •Dulcolax supp •Senna (1 tab PO qd) 	<ul style="list-style-type: none"> •D/C medlock •Dulcolax supp •Senna (1 tab PO qd) 	
PAIN/ SYMPTOM CONTROL	<ul style="list-style-type: none"> •Toradol 15 mg IV in PACU then q 8* until 5 doses (if nl creatinine & cardiac output) •PCA-MSO4 	<ul style="list-style-type: none"> •Complete Toradol IV •PCA-MSO4 	<ul style="list-style-type: none"> •Tylox PRN pain 	<ul style="list-style-type: none"> •Tylox PRN pain 	
NUTRITION	•NPO x ice chips	•Clear liquids	•Regular diet	•Regular diet	
D/C PLANNING	<ul style="list-style-type: none"> •Shands orientation - unit routines •Reinforce post-op care routines •Reinforce use of PCA pump •Explain PCA pump to family /SO •Check that patient and family have patient pathway 	<ul style="list-style-type: none"> •Begin home care instructions (see patient pathway) 	<ul style="list-style-type: none"> •Instruct patient on use of leg bag •Instruct on: <ul style="list-style-type: none"> - Incision care - S/S of infection - Activity after d/c - When to call MD - Use of incontinence pads 	<ul style="list-style-type: none"> •Complete home care instructions per patient pathway •Review prescriptions: <ul style="list-style-type: none"> - Tylox - Probanthine •If applicable demonstrate emptying & reactivation of JP •Review: <ul style="list-style-type: none"> - Adult incontinence pads - Wound care - S/S of infection - Activity - Return to clinic appointment - When to call MD 	

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